WHAT IS CLAIMED IS:

1. A method for generating a configuration of elements for at least one antenna, comprising the steps of:

selecting a simple antenna configuration including at least one antenna element;

applying a genetic algorithm to the simple configuration to generate an antenna configuration optimized for antenna characteristics.

2. The method of claim 1, further comprising a step of analyzing radiation characteristics of the simple antenna configuration, wherein the radiation characteristics are used in the step of applying a genetic algorithm to generate the antenna configuration optimized for antenna characteristics.

3. The method of claim 2, wherein the step of applying a genetic algorithm includes generating candidate antenna configurations, the step of analyzing radiation characteristics includes analyzing radiation characteristics of the candidate antenna configurations, and the steps of applying a genetic algorithm and analyzing radiation characteristics are repeated until the step of applying a genetic algorithm generates an optimal antenna configuration.

4. The method of claim 1, wherein the antenna characteristics include at least one of voltage standing wave ratio, gain, size, bandwidth, radiation pattern, and impedance.

5. The method of claim 1, wherein the step of applying a genetic algorithm optimizes at least one of geometry of elements, height of the antenna above a ground plane, and length of the antenna.

6. The method of claim 1, further comprising applying the genetic algorithm to generate at least one of optimized load placement and optimized load values for the antenna configuration.

7. The method of claim 1, further comprising applying a genetic algorithm to generate optimized design parameters of a matching network or balun to be connected to the antenna.

8. The method of claim 1, wherein the step of selecting a simple antenna configuration comprises randomly selecting antenna elements.

9. The method of claim 8, further comprising selecting elements that connect to the randomly selected elements to produce a stochastic configuration to which the genetic algorithm is applied.

10. The method of claim 1, wherein the step of applying a genetic algorithm includes optimizing each element of the antenna independently.

11. The method of claim 1, wherein the step of selecting a simple antenna configuration comprises selecting a motif.

12. The method of claim 1, wherein the simple antenna configuration is a Werner pattern.

13. The method of claim 1, further comprising performing an iterated process on the simple configuration to produce a fractal pattern to which the genetic algorithm is applied.

14. The method of claim 1, further comprising performing a semi-iterated process on the simple configuration to produce a semi-fractal pattern to which the genetic algorithm is applied.

15. The method of claim 1, wherein the step of applying a genetic algorithm generates a configuration of an array of antennas.

16. The method of claim 1, wherein the step of applying a genetic algorithm generates a configuration of elements for an individual antenna.

17. The method of claim 1, the steps of applying a genetic algorithm generates a configuration of antennas within an array and configurations of elements of the individual antennas within the array.

18. The method of claim 1, further comprising:

creating a pattern for a frequency selective surface for improving radiation characteristics of the antenna.

19. The method of claim 18, wherein the step of creating a pattern for a frequency selective surface comprises:

selecting a pattern for arranging electromagnetic materials on a substrate or a superstrate;

applying a genetic algorithm to the selected pattern to generate an optimized pattern of electromagnetic materials for forming a frequency selective surface on the substrate or superstrate.

20. A system for generating a configuration of elements for at least one antenna, comprising:

means for selecting a simple antenna configuration including at least one antenna element; and

means for applying a genetic algorithm to the simple configuration to generate an antenna configuration optimized for antenna characteristics.

21. The system of claim 20, further comprising:

means for analyzing radiation characteristics of the simple antenna configuration, wherein the radiation characteristics are used by the means for applying a genetic algorithm to generate the antenna configuration optimized for antenna characteristics.

22. The system of claim 21, wherein the means for applying a genetic algorithm generates candidate antenna configurations, and the means for analyzing radiation characteristics analyzes radiation characteristics of the candidate antenna configurations until the means for applying a genetic algorithm generates an optimal antenna configuration.

23. The system of claim 20, wherein the antenna characteristics include at least one of a voltage standing wave ratio, gain, size, bandwidth, radiation pattern, and impedance.

24. The system of claim 20, wherein the means for applying a genetic algorithm optimizes at least one of geometry of elements, height of the antenna above the ground plane, and length of the antenna.

25. The system of claim 20, further comprising means for applying a genetic algorithm for generating at least one of optimized load placement and optimized load values for the antenna configuration.

26. The system of claim 20, further comprising means for applying a genetic algorithm to generate optimized design parameters for a matching network or balun to be connected to the antenna.

27. The system of claim 20, wherein the means for selecting a simple antenna configuration randomly selects antenna elements.

28. The system of claim 27, further comprising means for selecting elements that connect to the randomly selected elements to produce a stochastic configuration to which the genetic algorithm is applied.

29. The system of claim 20, wherein the means for applying a genetic algorithm optimizes each element of the antenna configuration independently.

30. The system of claim 20, wherein the simple configuration selected is a motif.

31. The system of claim 20, wherein the simple configuration selected is a Werner pattern.

32. The system of claim 20, further comprising means for performing an iterated process on the simple configuration to produce a fractal pattern to which the genetic algorithm is applied.

33. The system of claim 20, further comprising means for performing a semi-iterated process on the simple configuration to produce a semi-fractal pattern to which the genetic algorithm is applied.

34. The system of claim 20, wherein the configuration of elements generated is a configuration of an array of antennas.

35. The system of claim 20, wherein configurations of elements for individual antennas are generated.

36. The system of claim 20, wherein configurations of elements for individual antennas are generated, and a configuration of the antennas within an array are generated.

37. The system of claim 20, further comprising:

means for creating a pattern for a frequency selective surface for improving radiation characteristics of the antenna.

38. The system of claim 37, wherein the means for creating a pattern for a frequency selective surface comprises:

means for selecting a pattern for arranging electromagnetic materials on a substrate or a superstrate; and

means for applying a genetic algorithm to the selected pattern to generate an optimized pattern of electromagnetic materials for forming a frequency selective surface on the substrate or superstrate.

39. A method for creating a pattern of electromagnetic materials on a substrate or superstrate for forming at least one frequency selective surface, comprising:

selecting a pattern for arranging the electromagnetic materials on the substrate or the superstrate;

applying a genetic algorithm to the selected pattern to generate an optimized pattern of electromagnetic materials for forming a frequency selective surface on the substrate or superstrate.

40. The method of claim 39, wherein the step of applying a genetic algorithm comprises modifying a geometry of the pattern.

41. The method of claim 40, wherein the step of applying a genetic algorithm also applies a genetic algorithm to characteristics of the substrate or superstrate to optimize these characteristics.

42. The method of claim 41, wherein the characteristics of the substrate or superstrate that are optimized include at least one of a thickness and a dielectric constant of the substrate or superstrate.

43. The method of claim 39, wherein the frequency selective surface includes a combination of frequency selective cells forming a screen.

44. The method of claim 43, wherein patterns for multiple screens and dielectric layers are produced by the method.

45. The method of claim 44, wherein the genetic algorithm is applied to generate an optimized stack of multiple screens and dielectric layers.

46. The method of claim 39, wherein the frequency selective surface is a high impedance, single band or multiband surface.

47. The method of claim 39, wherein the frequency selective surface forms a high impedance ground plane for a single band or multiband antenna.

48. The method of claim 39, wherein the frequency selective surface is part of a shield for shielding radio frequency energy emitted by an antenna.

49. The method of claim 39, wherein the frequency selective surface contains adjustable components enabling a frequency response of the frequency selective surface to be adjusted.

50. A system for creating a pattern of electromagnetic materials on a substrate or superstrate for forming at least one frequency selective surface, comprising:

means for selecting a pattern for arranging the electromagnetic materials on the substrate or superstrate; and

means for applying a genetic algorithm to the selected pattern to generate an optimized pattern of electromagnetic materials for forming a frequency selective surface on the substrate or superstrate.

51. The system of claim 50, wherein the means for applying a genetic algorithm comprises means for modifying a geometry of the pattern.

52. The system of claim 51, wherein the means for applying a genetic algorithm also applies a genetic algorithm to characteristics of the substrate or superstrate to optimize these characteristics.

53. The system of claim 52, wherein the characteristics of the substrate or superstrate that are optimized include at least one of a thickness and a dielectric constant of the substrate or superstrate.

54. The system of claim 50, wherein the frequency selective surface includes a combination of frequency selective cells.

55. The system of claim 54, wherein patterns for multiple screens and dielectric layers are produced by the apparatus.

56. The system of claim 55, wherein the genetic algorithm is applied to generate an optimized stack of multiple screens and dielectric layers.

57. The system of claim 50, wherein the frequency selective surface is a high impedance, single band or multiband surface.

58. The system of claim 50, wherein the frequency selective surface forms a high impedance ground plane for a single band or multiband antenna.

59. The system of claim 50, wherein the frequency selective surface is part of a shield for shielding radio frequency energy emitted by an antenna.

60. The system of claim 50, wherein the frequency selective surface contains adjustable components enabling a frequency response of the frequency selective surface to be adjusted.